

Application Number 09/848,483
Amendment dated January 6, 2004
Responsive to Office Action of October 6, 2003

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1 (Original): An apparatus for use in a switch array having spring elements, the apparatus comprising:

a bottom layer defining holes for aligning with spring elements; and
a top layer engaged with the bottom layer and biased away from the bottom layer upon protrusion of the spring elements through the holes in the bottom layer.

Claim 2 (Original): The apparatus of claim 1, wherein the top layer includes a plurality of top layer sections, and each of the top layer sections directs user actuated force against one of the spring elements.

Claim 3 (Original): The apparatus of claim 2, wherein the switch array is a keyboard.

Claim 4 (Original): The apparatus of claim 3, wherein each of the top layer sections is aligned with one of a plurality of keys in the keyboard.

Claim 5 (Original): The apparatus of claim 1, wherein the bottom layer and top layer define sets of hook-like elements that engage one another to define a distance of travel between the bottom layer and the top layer.

Claim 6 (Original): The apparatus of claim 5, wherein the top layer defines a plurality of top layer sections, and each of the top layer sections defines a set of hook-like elements for engagement with hook-like elements of the bottom layer.

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Claim 7 (Original): The apparatus of claim 6, wherein the top and bottom layers are films, and the hook-like elements are formed on the films.

Claim 8 (Original): The apparatus of claim 6, wherein the bottom layer is formed with regions defining areas for placement of the top layer sections.

Claim 9 (Original): The apparatus of claim 1, wherein the holes in the bottom layers are arranged to align with spring elements in the form of dome spring elements.

Claim 10 (Original): The apparatus of claim 1, wherein the holes are sized in the range of 0.1 to 2 square centimeters.

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Claim 11 (Original): The apparatus of claim 5, wherein the hook-like elements have a hook element width in the range of 0.01 centimeters to 1 centimeter.

Claim 12 (Original): The apparatus of claim 5, wherein the distance of travel is less than 3 millimeters.

Claim 13 (Original): The apparatus of claim 12, wherein the distance of travel is less than 2 millimeters.

Claim 14 (Original): The apparatus of claim 5, wherein the distance of travel is in the range of 0.01 to 1 centimeters.

Claim 15 (Original): The apparatus of claim 5, wherein the hook-like elements have a hook element height in the range of 0.05 to 1 centimeters.

Claim 16 (Original): The apparatus of claim 1, wherein the top layer includes substantially rigid elements and elastic regions between the rigid elements, each of the rigid elements being biased by one of the spring elements upon protrusion of the spring element through one of the holes.

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Claim 17 (Original): The apparatus of claim 16, wherein the rigid elements comprise keys.

Claim 18 (Original): A keyboard comprising:

an array of sensor elements that generate signals in response to a force;
an array of spring elements corresponding to the array of sensor elements;
a bottom layer defining holes for aligning with spring elements; and
a top layer engaged with the bottom layer and biased away from the bottom layer upon protrusion of the spring elements through the holes in the bottom layer.

Claim 19 (Original): The keyboard of claim 18, wherein the array of spring elements is an array of dome spring elements, wherein each of the dome spring elements defines a chamber, and wherein a plurality of channels interconnect the chambers of the dome spring elements such that each the chamber of each dome spring element is in fluid communication with the chamber of at least one of the other dome spring elements.

Claim 20 (Original): The keyboard of claim 18, wherein the bottom layer and top layer define sets of hook-like elements that engage one another to limit a distance of travel between the bottom layer and the top layer.

Claim 21 (Original): The keyboard of claim 20, wherein the top layer defines a plurality of top layer sections, and each of the top layer sections defines a set of hook-like elements for engagement with hook-like elements of the bottom layer.

Claim 22 (Original): The keyboard of claim 21, wherein each of the top layer sections is a key.

Claim 23 (Original): The keyboard of claim 18, wherein the top layer includes substantially rigid elements and elastic regions between the rigid elements, each of the rigid elements being biased by one of the spring elements upon protrusion of the spring element through one of the holes.

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Claim 24 (Original): The keyboard of claim 23, wherein the rigid elements comprise keys.

Claim 25 (Original): The keyboard of claim 18, wherein the top and bottom layers are films.

Claim 26 (Original): The keyboard of claim 18, further comprising keycaps attached to the top layer.

Claim 27 (Original): The keyboard of claim 18, wherein the array of spring elements are attached to the top layer.

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Claim 28 (Original): The keyboard of claim 21, wherein the bottom layer is formed with regions defining areas for placement of the top layer sections.

Claim 29 (Original): A system comprising:

a processor coupled to an input device, the input device including an array of sensor elements that generate signals in response to a force, and an array of spring elements corresponding to the sensor elements,

the input device further including a bottom layer defining holes for aligning with spring elements and a top layer engaged with the bottom layer and biased away from the bottom layer upon protrusion of the spring elements through the holes in the bottom layer.

Claim 30 (Original): The system of claim 29, wherein the array of spring elements is an array of dome spring elements, wherein each of the dome spring elements defines a chamber, and

wherein a plurality of channels interconnect the chambers of the dome spring elements such that the chamber of each dome spring element is in fluid communication with the chamber of at least one of the other dome spring elements.

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Claim 31 (Original): The system of claim 29, wherein the bottom layer and top layer define sets of hook-like elements that engage one another to limit a distance of travel between the bottom layer and the top layer.

Claim 32 (Original): The system of claim 31, wherein the top layer defines a plurality of top layer sections, and each of the top layer sections defines a set of hook-like elements for engagement with hook-like elements of the bottom layer.

Claim 33 (Original): The system of claim 32, wherein the bottom layer is formed with regions defining areas for placement of the top layer sections.

Claim 34 (Original): The system of claim 32, wherein each of the top layer sections is a key.

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Claim 35 (Original): The system of claim 29, wherein the top layer includes substantially rigid elements and elastic regions between the rigid elements, each of the rigid elements being biased by one of the spring elements upon protrusion of the spring element through one of the holes.

Claim 36 (Original): The system of claim 35, wherein the rigid elements comprise keys.

Claim 37 (Original): The system of claim 29, wherein the top and bottom layers are hook films including hook-like elements that provide an interlocking arrangement between the top and bottom layers.

Claim 38 (Original): The system of claim 29, further comprising keycaps attached to the top layer.

Claim 39 (Original): The system of claim 29, wherein the system is a desktop computer and the input device is a keyboard.

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Claim 40 (Original): The system of claim 29, wherein the system is a laptop computer and the input device is a keyboard on the laptop computer.

Claim 41 (Original): The system of claim 29, wherein the system is a handheld computer and the input device is a key pad on the handheld computer.

Claim 42 (Original): The system of claim 29, wherein the system is a cellular telephone and the input device is a key pad on the cellular telephone.

Claim 43 (Original): The system of claim 29, wherein the system includes an instrument panel and the input device is a key pad on the instrument panel.

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Claim 44 (Original): The system of claim 29, wherein the system is an appliance and the input device is a key pad on the appliance.

Claim 45 (Original): The system of claim 29, wherein the array of spring elements are attached to the top layer.

Claim 46 (Original): An apparatus comprising:
a bottom layer,
a top layer, and
means for engaging the top and bottom layer such that upon engagement, an amount of travel is defined between the top and bottom layers.

Claim 47 (Original): The apparatus of claim 46, wherein the means for engaging includes a plurality of hook-like elements.

Claim 48 (Currently amended): An apparatus comprising:
a first layer including a first set of hook-like elements,

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a second layer including a second set of hook-like elements, wherein the first and second sets of hook-like elements are engaged, thereby attaching the first layer to the second layer, wherein the engaged sets of hook-like elements collectively define a distance of travel between the first and second layers.

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Claim 49 (Canceled)

Claim 50 (Original): The apparatus of claim 48, wherein the distance of travel is in the range of 0.05 centimeters to 1 centimeter.

Claim 51 (Original): The apparatus of claim 48, further comprising a spring element biasing the first and second layers away from one another.
